

WHAT IS CLAIMED IS:

1 1. An apparatus for processing a substrate, the apparatus comprising:
2 (a) a first atmospheric deposition station;
3 (b) a second atmospheric deposition station comprising an atmospheric
4 pressure vapor deposition chamber, wherein the first atmospheric deposition station and the
5 second atmospheric deposition station are coupled together; and
6 (c) a substrate handling system adapted to transfer substrates between the
7 atmospheric deposition station and the second atmospheric deposition station.

1 2. The apparatus of claim 1 wherein the first atmospheric deposition
2 station comprises a spin coating chamber.

1 3. The apparatus of claim 1 wherein the first atmospheric deposition
2 station comprises an ultrasonic spray deposition device.

1 4. The apparatus of claim 1 further comprising:
2 a plasma system associated with the atmospheric pressure vapor deposition
3 chamber.

1 5. The apparatus of claim 4 wherein the plasma system is a remote
2 plasma system that is adapted to form a plasma upstream of the atmospheric vapor deposition
3 chamber.

1 6. The apparatus of claim 1 further comprising a curing station.

1 7. The apparatus of claim 1 wherein the substrates are semiconductor
2 substrates.

1 8. The apparatus of claim 1 wherein the first atmospheric deposition
2 station is adapted to deposit a layer to be formed into a porous dielectric layer on the
3 substrate, and second atmospheric deposition station is adapted to deposit a capping layer on
4 the porous dielectric layer.

1 9. The apparatus of claim 1 wherein the atmospheric vapor deposition
2 chamber is an atmospheric chemical vapor deposition (APCVD) chamber.

10. The apparatus of claim 1 wherein the first atmospheric deposition station comprises a liquid dispenser.

11. An apparatus for processing semiconductor substrates, the apparatus comprising:

- (a) an atmospheric chemical vapor deposition chamber;
- (b) a plasma system associated with the atmospheric chemical vapor deposition chamber;
- (c) a spin coating chamber coupled to the atmospheric deposition chamber;
- (d) a curing station coupled to the atmospheric deposition chamber; and
- (e) a substrate handling system adapted to transfer substrates between the atmospheric deposition chamber, the spin coating chamber, and the curing station.

12. The apparatus of claim 11 wherein the plasma system is a remote plasma system adapted to generate a plasma upstream of the atmospheric chemical vapor deposition chamber.

13. The apparatus of claim 11 wherein the substrate handling system comprises a plurality of substrate handlers with arms.

14. The apparatus of claim 11 wherein the apparatus is a cluster tool.

15. The apparatus of claim 11 wherein the spin coating chamber is adapted to deposit a layer that is to be formed into a porous dielectric layer, and wherein the atmospheric chemical vapor deposition chamber is adapted to deposit a cap layer on the porous dielectric layer.

16. A method for processing a substrate using a substrate processing apparatus, the method comprising:

- (a) depositing a first layer on a substrate at atmospheric pressure at a first atmospheric deposition station;
- (b) transferring the substrate to an atmospheric vapor deposition chamber at a second atmospheric deposition station using a substrate transfer system; and

7 (c) depositing a second layer on the substrate at atmospheric pressure
8 within the atmospheric vapor deposition chamber at atmospheric pressure.

1 17. The method of claim 16 wherein the substrate is a semiconductor
2 substrate.

1 18. The method of claim 16 wherein the first atmospheric deposition
2 station comprises a spin coating chamber.

1 19. The method of claim 16 further comprising:
2 forming a porous dielectric layer from the deposited first layer, and wherein
3 depositing the second layer on the substrate comprises depositing the second layer on the
4 porous dielectric layer.

1 20. The method of claim 19 wherein the porous layer and the cap layer
2 comprise dielectric materials.

1 21. The method of claim 16 further comprising:
2 curing the first layer at a curing station.

1 22. The method of claim 16 wherein the atmospheric vapor deposition
2 chamber is an atmospheric chemical vapor deposition (APCVD) chamber.

1 23. The method of claim 16 wherein depositing the first layer comprises
2 depositing a liquid on the substrate.